

Claims 27 – 30 (Canceled)

REMARKS/ARGUMENTS

Claims 23 – 26 remain in the application.

Claims 1 – 22 and 27 – 30 have been cancelled.

Claims 23 and 24 stand allowed.

Claims 25 and 26 are presently amended.

Claims 23 – 26 had been allowed by the Office Action of May 31, 2005. However, the Office Action of November 9, 2005 withdrew the allowance of claims 25 and 26 on the basis of newly cited prior art. Previous claims 25 and 26 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 3,053,182 to G.B. Christopher in view of either one of U.S. Patent No. 3,599,567 to S.T. Graham et al or U.S. Patent No. 4,961,381 to P.D. McLaughlin.

Additionally, previous claims 25 and 26 were rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,046,563 to W.T. Engle et al in view of either one of Graham et al or McLaughlin.

Applicant's invention of claims 25 and 26, as presently amended, comprises a shaped charge tubing cutter having explosive material formed into the shape of a pair of truncated cones. The cones are mated axially within a cylindrical housing with the truncated apices joined in a common plane. An axial aperture crosses the common plane to receive a detonation booster therein. A distal end closure for the housing supports an axial projection having an external perimeter that is less than the external perimeter of the housing (claim 25). Amended claim 26 describes this same axial projection geometry as a substantially conical end closure. The end closure projection supports a structurally integral planar element at a single point proximate of the projection axis. A plurality of centralizing blade portions of the planar element extend radially from the axis in a plane normal to the axis. Paragraph [0032] of applicant's specification and Figure 2 of applicant's drawings provide original disclosure justification for these claim distinctions.

The G.B. Christopher patent describes a well casing cutter that comprises three frusto-conical shaped charge cutters separated by two frusto-spherical explosive units. Each of the frusto-conical cutters comprises a pair of frusto-cones joined at the truncated apex. The explosive assembly is enclosed within a housing void space between opposing end walls. A plurality of centralizing wires, each secured at one end to the explosive housing, project from the housing at a raked angle to the longitudinal housing axis.

The S.T. Graham et al patent describes a conical plastic drive point having a pair of integrally molded "wings" projecting radially from a cylindrical rim of the drive point. A distal end of a cylindrical, "shot hole" explosive charge is inserted into a hollow cylindrical socket between the "wing" projections. The conical point is perforated to allow water penetration internally of the conical point. Hence, the Graham et al drive point is not a closed distal end for an explosive housing. The "wings" are primarily barbs to prevent the charge from buoyantly floating out of "shot hole" although the inventors also attribute a centralizing function to the "wings".

The McLaughlin patent describes a plastic, explosive primer centralizer that comprises three "spikes" radiating from a central ring. The central ring encompasses an explosive primer charge. An uncased blasthole is bored into an oil-sand deposit to receive a half-charge of explosive powder. The primer and centralizing ring is next positioned in the blasthole into the first half-charge of powder and the second half-charge of powder added over the primer. Detonation collapses an area of the oil-sand deposit for bucketwheel removal.

The disclosures of McLaughlin and Graham et al have been combined with the Christopher disclosure on the premise that it would be obvious to one of ordinary skill in the art to substitute integral centralizing blades extending normal to the axis of the explosive as allegedly taught by McLaughlin and Graham et al for the several biased spring wires of the Christopher casing cutter. This constructive assembly of prior art is justified by the Office Action as the mere substitution of known centralizers to perform the same function in substantially the same way.

Respectfully, the rejection premise is incorrect. **The constructive assembly**

proposed by the Examiner would NOT perform the same function in substantially the same way.

The centralizer designs of **neither** McLaughlin nor Graham et al **will flex within the circular profile of the structural support ring.**

The claimed invention is for a **shaped charge tubing cutter** having a distinctive **centralizer spring attached by a single fastener along the tool axis**. As explained by Applicant's specification paragraphs [0002] through [0007] and the graph of Figure 1, tubing cutters are only permitted an extremely small perimeter clearance between the inside diameter of the tubing wall and the outside diameter of the cutter housing (0.10" to 0.30"). This small perimeter clearance permissible to tubing cutters leaves no room for a centralizer projection from the outer perimeter surface of the cutter housing. Hence, the centralizer designs of **McLaughlin and Graham et al are non-functional for a tubing cutter.**

Although not a tubing cutter, the Christopher casing cutter disclosure is relevant to the degree that a very small perimeter clearance between the cutter housing and the inside diameter of the casing is required. Such is the reason for the angle given to the centralizing spring wires 17 as projected from a reduced diameter bull plug 13. Note that the wires 17 of Christopher may flex within the projected area of the housing 12. A mere substitution of the McLaughlin and Graham et al centralizers for the angularly biased wires of Christopher would not accomplish the required result or meet the terms of the amended claims. **The centralizing wires of the Examiner's hypothetical combination would flex about the outside perimeter of the bull plug 13; not the cutter axis.**

A second rejection of claims 25 and 26 was based upon a combination of the Graham et al and McLaughlin disclosures with that of Engel et al. The Engel et al patent discloses a tubing cutter having three individual spring blades for centering the cutter within a tubing bore. One end of each spring blade is anchored to a transverse face of the cylindrical cutter housing. From the anchor point, the blades are arced away from the cutter body more than 90° with the free distal ends approaching an extension of the cylinder axis. The blade arc is slightly outside the projected circumference of the cylindrical cutter housing thereby providing a resilient centralizing

force on the cutter.

True centering of the Engel et al cutter within the tubing bore is dependent on the precise placement of the spring blade anchoring screws 30 relative to the cutter housing axis and of a uniform arc profile for each of blades 28. There may also be variability in the thickness or bending modulus characteristics of the several spring blades. All of these practical, manufacturing concerns are avoided by Applicant's integral, flat spring configuration that attaches to reduced diameter projection from end of the cutter housing by a **single fastener** on the housing axis. All blade projections of Applicant's claimed design are **integral elements of the same material sheet** so the mechanical properties are identical. Applicant's single, axially aligned attachment screw socket is easily positioned at a true axial location. The distal tips of Applicant's several blade projections may easily and inexpensively be ground to a precise radius from the central attachment aperture. When that radius is selected to be the tubing inside bore diameter or only slightly greater, the blades may flex in either direction to permit axial movement of the cutter in either axial direction along the tubing bore.

In both of the McLaughlin and Graham et al disclosures, the radially projecting centralizing springs are secured to a ring base. This ring base is designed to fit over the housing of an explosive unit. In the case of the McLaughlin patent, this fit is explicitly described at column 2, lines 55-58. "As can be seen in FIG. 2, a flexible inner lip (11a) on the inside perimeter of the disc (11) ensures that the centering device will fit tightly over the primer case." The relationship described by McLaughlin, if applied to Engel et al would adversely affect the tubing cutting purpose of Engel et al. A fit of the spike 13 support ring 11 (which McLaughlin characterizes as a "disc") over the Engle et al housing would unacceptably increase the radial distance between the Engel et al explosive charge 58 and the inside wall surface of the tubing cut objective. Exactly the same observation may be applied to the Graham et al disclosure. The drive point of Graham et al is designed to fit over the outside surface of the explosive housing. Such an assembly relationship could never be considered for a tubing cutter as claimed by applicant.

In view of Applicant's foregoing amendments and remarks, Applicant respectfully requests the Examiner's favorable reconsideration of claims 25 and 26.

Claims 23 through 26 are submitted as patentably novel over the prior art and in present condition for allowance.

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Respectfully Submitted,



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